

ATTACHMENT J.4.98
EVENT CATEGORIZATION/CLASSIFICATION PROCEDURE
EM-0025

EVENT CATEGORIZATION/CLASSIFICATION PROCEDURE

EM-0025

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11/18/97
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11-18-97
Date

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

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Title: EVENT CATEGORIZATION/ CLASSIFICATION PROCEDURE <i>Compliance with this procedure is mandatory while performing the activities within its scope. Only a controlled copy may be used in the performance of work.</i>	DOCUMENT NO: EM-0025	
	Date: 11/27/97	Revision No. 3
	Page 1 of 45	

TABLE OF CONTENTS

<u>SECTION</u>	<u>TITLE</u>	<u>PAGE</u>
1.0	PURPOSE	3
2.0	SCOPE	3
3.0	REFERENCES	3
4.0	RESPONSIBILITIES	3
5.0	GENERAL	4
6.0	PREREQUISITES	5
7.0	PROCEDURE	5
	7.1 FACILITY CONDITION	5
	7.2 ENVIRONMENTAL	14
	7.3 PERSONNEL SAFETY	18
	7.4 PERSONNEL RADIATION PROTECTION	20
	7.5 SAFEGUARDS AND SECURITY	22
	7.6 TRANSPORTATION	27
	7.7 VALUE BASED REPORTING	31
	7.8 FACILITY STATUS	32
	7.9 NUCLEAR EXPLOSIVE SAFETY	33
	7.10 CROSS-CATEGORY ITEMS	33
8.0	RECORDS	34
9.0	DRIVERS	34
10.0	DEFINITIONS	35

LIST OF ATTACHMENTS

ATTACHMENT A - TYPES OF EXPOSURE	43
ATTACHMENT B - TABLE 1 OF THE EH412 MEMORANDUM "APPLICATION OF DOE 5400.5 REQUIREMENTS FOR RELEASE AND CONTROL OF PROPERTY CONTAINING RESIDUAL RADIOACTIVE MATERIAL" . . .	44
ATTACHMENT C - FEMP FACILITY BOUNDARIES	45

Title: EVENT CATEGORIZATION/ CLASSIFICATION PROCEDURE <i>Compliance with this procedure is mandatory while performing the activities within its scope. Only a controlled copy may be used in the performance of work.</i>	DOCUMENT NO: EM-0025	
	Date: 11/27/97	Revision No. 3
	Page 2 of 45	

ISSUE AND REVISION SUMMARY

Revision	Date	Description of Issue or Revision
0	10/15/93	New document for categorizing/classifying reportable occurrences at the Fernald Environmental Management Project (FEMP, per Request No. S93-134, initiated by G. Campbell.
1	06/03/94	Minor revision to document, per Request S94-023, initiated by G. Campbell. This document supersedes SSOP-1018, dated 10/15/93, Rev. 0.
2	02/23/96	Revisions to document based on DOE Order 232.1, which replaces DOE Order 5000.3B. Revisions initiated by L. Morrow/L. Rogers. This document supersedes EM-0025, Revision 1, dated 06/03/94.
3	11/27/97	Revisions to document based on DOE Order 232.1A, which simply clarified categorization/classification requirements in DOE Order 232.1. Revisions initiated by L. Morrow. This document supersedes EM-0025, Revision 2, dated 02/23/96 and all existing ICPs.

Title: EVENT CATEGORIZATION/ CLASSIFICATION PROCEDURE <i>Compliance with this procedure is mandatory while performing the activities within its scope. Only a controlled copy may be used in the performance of work.</i>	DOCUMENT NO: EM-0025	
	Date: 11/27/97	Revision No. 3
	Page 3 of 45	

1.0 PURPOSE

This procedure provides criteria for the site specific event categorization and classification of incidents in the implementation of DOE Order 232.1A. Appropriate categorization/classification is critical to the implementation of procedure EM-0010, Event Notification and Occurrence Reporting, and completion of timely notifications.

2.0 SCOPE

This procedure applies to all personnel including; Team Leaders, Team Coaches,, Communication Center Operators, Duty Officers (Emergency Duty Officer (EDO) and Assistant Emergency Duty Officer(AEDO)), and Department of Energy (DOE) employees.

3.0 REFERENCES

- 3.1 PL-3020, FEMP Emergency Plan
- 3.2 EM-0010, Event Notification and Occurrence Reporting Procedure
- 3.3 DOE Notice 441.1, Radiological Protection for DOE Activities
- 3.4 DOE Order 5400.5, Radiation Protection for the Public and the Environment
- 3.5 DOE/EH-0256T, DOE Radiological Control Manual
- 3.6 DOE STD 1045-93, Guide to Good Practices for Notifications and Investigation of Abnormal Events
- 3.7 RM-0016, Management Plan
- 3.8 RP-0007, Radiological Posting and Access to Radiological Areas
- 3.9 PL-3049, Implementation Plan for Safety Analysis Reports and Technical Safety Requirements at the FEMP
- 3.10 10 CFR 835, Occupational Radiation Protection

4.0 RESPONSIBILITIES

- 4.1 Assistant Emergency Duty Officer (AEDO) - Initially assesses events, and assists the Fluor Daniel Fernald (FDF) Emergency Duty Officer (EDO) with event categorization.

Title: EVENT CATEGORIZATION/ CLASSIFICATION PROCEDURE <i>Compliance with this procedure is mandatory while performing the activities within its scope. Only a controlled copy may be used in the performance of work.</i>	DOCUMENT NO: EM-0025	
	Date: 11/27/97	Revision No. 3
	Page 4 of 45	

- 4.2 **Emergency Duty Officer (EDO)** - FDF site management representative responsible for classifying events, establishing contact with DOE, initiating appropriate internal and external notifications, and activation of the Emergency Operations Center (EOC), as necessary.
- 4.3 **Employee** - Upon discovery of an emergency or abnormal event, takes immediate action to ensure his/her safety including evacuation of the area, sheltering, or other actions as may be appropriate; warns other personnel in the area to protect themselves; and promptly reports the event either to his/her supervisor or directly to the Communications Center (via extension 6511 for emergencies, x-4444 for non-emergencies, hand-held radio or fire alarm pull-box (emergency only)).
- 4.4 **Project Team Coach/Team Leader**
1. Immediately reports the incident to the AEDO through the Communications Center Operator, or directly to the AEDO by radio or telephone.
 2. Investigates and performs preliminary evaluation of the magnitude and nature of the incident, isolates and secures affected areas, and initiates corrective or response actions if possible under safe conditions, until the AEDO responds to the scene.
 3. The responsible Project Team Coach/Team Leader of the personnel involved in the event makes an entry into that organization's daily logs as required by the Conduct of Operation Guidelines.

NOTE: Included in this entry is enough information to reconstruct the event and its associated corrective actions plus the estimated dollar amounts of damage to property or cost of the corrective actions taken. A copy of this entry is forwarded to Emergency Preparedness within 24 hours. Emergency Preparedness forwards a copy of this daily log to appropriate site personnel.

5.0 **GENERAL**

- 5.1 DOE Order 232.1A "Occurrence Reporting and Processing of Operations Information" arranges occurrences into ten groups which relate to DOE operations. These ten groupings are used solely for ease of reference and do not represent program requirements.

Title: EVENT CATEGORIZATION/ CLASSIFICATION PROCEDURE <i>Compliance with this procedure is mandatory while performing the activities within its scope. Only a controlled copy may be used in the performance of work.</i>	DOCUMENT NO: EM-0025	
	Date: 11/27/97	Revision No. 3
	Page 5 of 45	

5.2 The ten groups of categorized occurrences are:

1. Facility Condition
2. Environmental
3. Personnel Safety
4. Personnel Radiation Protection
5. Safeguards and Security
6. Transportation
7. Value Basis Reporting
8. Facility Status
9. Nuclear Explosive Safety - Not Applicable at the Fernald Environmental Management Project (FEMP).
10. Cross-Category Items

5.3 The categories of occurrences are designed to be generic. For example, the environmental section (Group 2) provides much less detail than would be found in a site-specific matrix of occurrences, which typically lists hazardous materials and limits specific to a particular operation. The objective of this approach is to allow individual sites to fit their site-specific requirements to these categories. Note that some occurrences may fit in more than one group.

6.0 PREREQUISITES

None.

7.0 PROCEDURE

NOTE: Categorization/classification of occurrences by their seriousness is required in order to ensure that the urgency of notification is readily identifiable and that the more serious occurrences are highlighted to management. For reporting purposes, categorization under ambiguous circumstances will begin at the highest level and the event will be downgraded if and when more conclusive data is obtained.

7.1 FACILITY CONDITIONS

1. Nuclear Criticality Safety

A. Site Area Emergency

Confirmed nuclear criticality achieved in a system not intended to reach criticality. Two or more criticality alarms activated.

Title: EVENT CATEGORIZATION/ CLASSIFICATION PROCEDURE <i>Compliance with this procedure is mandatory while performing the activities within its scope. Only a controlled copy may be used in the performance of work.</i>	DOCUMENT NO: EM-0025	
	Date: 11/27/97	Revision No. 3
	Page 6 of 45	

B. Alert

Suspected nuclear criticality achieved in a system not intended to reach criticality. One criticality alarm activated.

C. Unusual Occurrence

Violation of the double contingency criticality specifications such that no valid controls are available to prevent a criticality accident.

D. Off-Normal

Any nuclear criticality safety violation or infraction of procedures not covered by other reporting criteria. For example, violation of a single contingency such that only one valid criticality control remains in place.

2. Fires/Explosions

A. General Emergency

Onsite fire/explosion that results in a release of radioactive or hazardous material, which is expected to exceed appropriate Protective Action Guideline (PAG) or Emergency Response Protective Guidelines (ERPG) exposure levels offsite.

B. Site Area Emergency

1. Onsite fire/explosion that results in a release of radioactive or hazardous material, which is expected to exceed appropriate PAG or ERPG exposure levels onsite, not offsite.
2. Any occurrence not under control causing more than minor damage to multiple facilities.

C. Alert

1. A fire in an area where there may be a release of radioactive or Hazardous Material, which cannot be contained within 30 minutes once the Emergency Response Team arrives and begins to extinguish the Fire.
2. Onsite explosion that results in a release of radioactive or hazardous material.

Title: EVENT CATEGORIZATION/ CLASSIFICATION PROCEDURE	DOCUMENT NO: EM-0025	
<i>Compliance with this procedure is mandatory while performing the activities within its scope. Only a controlled copy may be used in the performance of work.</i>	Date: 11/27/97	Revision No. 3
	Page 7 of 45	

3. Any occurrence not under control causing more than minor damage to confinement system, or loss of building integrity.

D. Unusual Occurrence

Any fire or explosion within primary confinement/ containment boundaries of a nuclear facility.

E. Off-Normal

NOTE: Fire suppression system will be considered as activated once there is an unplanned flow of water through the installed sprinkler system.

1. Any fire or explosion not required to be reported as an Unusual Occurrence that activates a fire suppression system (e.g., halon discharge, sprinkler heads activating) or disrupts normal facility operations.
2. Any unplanned fire, that takes longer than 10 minutes to extinguish following the arrival of fire protection personnel; this does not include fires that do not disrupt normal facility operations and which are in the initial or beginning stage that can be controlled or extinguished by portable fire extinguishers, Class II standpipe, or small hose systems without need for protective clothing or breathing apparatus.

3. Safety Status Degradation

A. Unusual Occurrence

1. Any violation or noncompliance of an approved Technical Safety Requirement (Technical Specification or Operational Safety Requirement) or other operational safety limit defined by the contractor/DOE.
2. Discovery of an incorrectly derived Technical Safety Requirement (Technical Specification or Operational Safety Requirement) or other operational safety limit defined by the contractor or/DOE.
3. Any operation outside the authorization basis of the facility or process.

Title: EVENT CATEGORIZATION/ CLASSIFICATION PROCEDURE <i>Compliance with this procedure is mandatory while performing the activities within its scope. Only a controlled copy may be used in the performance of work.</i>	DOCUMENT NO: EM-0025	
	Date: 11/27/97	Revision No. 3
	Page 8 of 45	

4. Any occurrence that would prevent immediate facility or offsite emergency response capabilities.
5. Discovery of an actual Unreviewed Safety Question (USQ) which reveals a currently existing inadequacy in the approved authorization basis.

B. Off-Normal

1. Discovery of a condition that leads the facility operating personnel to limit facility operations, either self-imposed or due to the identification of a potential degradation of the authorization bases of a facility or process. This includes the discovery of analytical errors, omissions, or inadequacies that present the potential for an USQ.
2. Discovery of a potential USQ that could affect the present or future operation of the facility. Routine USQ determinations due to planned system or operational modifications are not reportable under this criteria.

4. Loss of Control of Radioactive Material/Spread of Radioactive Contamination.

A. Unusual Occurrence

1. Identification of radioactive contamination offsite in excess 100 times any of the surface contamination levels specified in DOE Order 5400.5, Radiation Protection of the Public and the Environment, Figure IV-1, that has not been previously identified and formally documented. For the first group listed in Figure IV-1 (i.e., transuranics...) Use the values specified in Table 1 (see Attachment B of this procedure) of the EH-412 memorandum "Application of DOE 5400.5 Requirements for Release and Control of Property Containing Residual Radioactive Material," dated November 17, 1995.
2. Loss of accountability of a sealed source or identification of lost radioactive material that exceeds 100 times the quantities specified in DOE Notice 441.1, "Radiological Protection for DOE Activities."

Title: EVENT CATEGORIZATION/ CLASSIFICATION PROCEDURE <i>Compliance with this procedure is mandatory while performing the activities within its scope. Only a controlled copy may be used in the performance of work.</i>	DOCUMENT NO: EM-0025	
	Date: 11/27/97	Revision No. 3
	Page 9 of 45	

3. Any fissile material in a process or non-process system outside primary confinement boundaries not designed or expected to accommodate such material.

B. Off-Normal

1. Any unplanned spill of liquids in excess of one (1) gallon, contaminated with radioactive material in concentrations greater than five (5) times the Derived Concentration Guide (DCG) values listed in DOE Order 5400.5, Figure III-1.
2. Identification of radioactive contamination outside a radiological area (as defined in 10 CFR 835, Occupational Radiation Protection), Radiological Buffer Area, or Category I Controlled Area (as defined in RP-0007), but within a Category II Controlled Area (as defined in RP-0007), in excess of ten (10) times the total contamination levels in 10 CFR 835, Appendix D.
3. Identification of radioactive contamination onsite that is not located within a Controlled Area, Fixed Contamination Area, or Soil Contamination Area, and is in excess of two (2) times the total contamination levels in 10 CFR 835, Occupational Radiation Protection, Appendix D.
4. Identification of radioactive contamination offsite in excess of the surface contamination levels specified in DOE 5400.5, Figure IV-1, that has not been previously identified and formally documented. For the first group listed in Figure IV-1 (i.e., transuranics...) use the values specified in Table 1 (see Attachment B of this procedure) of the EH-412 memorandum "Application of DOE 5400.5 Requirements for Release and Control of Property Containing Residual Radioactive Material," dated November 17, 1995.
5. Loss of accountability of a sealed source or identification of lost radioactive material that exceeds ten (10) times and is less than 100 times the quantities specified in DOE Notice 441.1, "Radiological Protection for DOE Activities."
6. Loss of accountability of a sealed source or identification of lost radioactive material that is one to ten (10) times the quantities specified in DOE Notice 441.1, "Radiological Protection for DOE Activities."

Title: EVENT CATEGORIZATION/ CLASSIFICATION PROCEDURE <i>Compliance with this procedure is mandatory while performing the activities within its scope. Only a controlled copy may be used in the performance of work.</i>	DOCUMENT NO: EM-0025	
	Date: 11/27/97	Revision No. 3
	Page 10 of 45	

5. **Safety Structure/System/Component (SSC) Degradation**

NOTE: DEFINITIONS APPLICABLE TO THIS SECTION ONLY:

Safety Class SSC's are identified in project specific safety documents or in PL-3049, Implementation Plan for Safety Analysis Reports and Technical Safety Requirements at the FEMP.

Safety Significant SSC's are identified in project specific safety documentation or in PL-3049, Implementation Plan for Safety Analysis Reports and Technical Safety Requirements at the FEMP.

A. **Unusual Occurrence**

Performance degradation of any Safety Class SSC that prevents satisfactory performance of its design function when it is required to be operable or in operation.

B. **Off-Normal**

1. Performance degradation of any Safety Class SSC that prevents satisfactory performance of its design function when it is not required to be operable or in operation (e.g., fire protection systems, excluding those in office spaces; radiation monitoring systems such as continuous air monitors; criticality alarm systems; shielding).
2. Performance degradation of any nuclear or non-nuclear Safety Significant SSC that prevents satisfactory performance of its design function when the equipment is required to be operable or in operation.

6. **Violation/Inadequate Procedures**

A. **Unusual Occurrence**

1. Maintenance performed on Safety Class SSC equipment without meeting the required plant conditions for non-availability resulting in a performance degradation.
2. Incorrect maintenance (including calibration) on, or unauthorized modifications to Safety Class SSC that was required to be operable or in operation and results in a performance degradation.

Title: EVENT CATEGORIZATION/ CLASSIFICATION PROCEDURE <i>Compliance with this procedure is mandatory while performing the activities within its scope. Only a controlled copy may be used in the performance of work.</i>	DOCUMENT NO: EM-0025	
	Date: 11/27/97	Revision No. 3
	Page 11 of 45	

B. Off-Normal

1. Any violation resulting in actual equipment damage in excess of \$10,000.
2. Use of inadequate procedures or deviations from written procedures that result in adverse effects on performance, safety, or reliability.
3. Incorrect maintenance (including calibration) on or unauthorized modifications to Safety Significant SSC required to be operable or in operation.

7. Oversight Activities

A. Unusual Occurrence

Any internal/external oversight activity discovering unsatisfactory operation, testing, maintenance, or modification of any Safety Class SSC that is required to be operable or in operation.

B. Off-Normal

Any internal/external oversight activity discovering unsatisfactory operation, testing, maintenance, or modification of any Safety Significant SSC required to be operable or in operation.

8. Operations

A. General Emergency: Dangerous Weather Conditions

1. Earthquake occurs resulting in a radiological or hazardous material release that exceeds appropriate Protective Action Guide (PAG) or Emergency Response Planning Guide (ERPG) exposure levels offsite.
2. Tornado striking site causing major and severe damage, or striking a radiological or hazardous material storage building resulting in a release that exceeds appropriate Protective Action Guide (PAG) or Emergency Response Planning Guide (ERPG) exposure levels offsite.

Title: EVENT CATEGORIZATION/ CLASSIFICATION PROCEDURE <i>Compliance with this procedure is mandatory while performing the activities within its scope. Only a controlled copy may be used in the performance of work.</i>	DOCUMENT NO: EM-0025	
	Date: 11/27/97	Revision No. 3
	Page 12 of 45	

B. Site Area Emergency: Dangerous Weather Conditions

1. Earthquake occurs resulting in a radiological or hazardous material release that exceeds appropriate Protective Action Guide (PAG) or Emergency Response Planning Guide (ERPG) exposure levels.
2. Tornado striking site causing major and severe damage, or striking a radiological or hazardous material storage building resulting in a release that exceeds appropriate Protective Action Guide (PAG) or Emergency Response Planning Guide (ERPG) exposure levels.

C. Alert

1. Loss of any primary confinement/containment which results in uncontrolled hazardous material/energy release.
2. Tornado strike on FEMP property with severe damage.
3. Any request to an offsite authority for emergency assistance resulting from the activation of an emergency/contingency operation or plan. This does not include responses covered under executed automatic response agreements between the FEMP and external emergency response groups/organizations.

D. Unusual Occurrence

1. Actuation of Safety Class SSC or their alarms resulting from an actual unsafe condition, Inadvertent alarms are not required to be reported unless an actuation of a Safety Class SSC occurs and the actuation is considered significant as defined by the approved facility procedures. Actuation of continuous air monitoring systems identified as Safety Class equipment do not have to be reported if their actuation was found to be due to radon-Thoron effects on the system or their actuation is expected due to maintenance tasks and other planned operations in the facility where the potential for release of radioactivity is anticipated to occur and the workers are appropriately protected.
2. Loss of incoming alternating current (AC) power and a failure of any backup emergency power system to operate, when the backup emergency power system supplies power to a Safety Class SSC.

Title: EVENT CATEGORIZATION/ CLASSIFICATION PROCEDURE <i>Compliance with this procedure is mandatory while performing the activities within its scope. Only a controlled copy may be used in the performance of work.</i>	DOCUMENT NO: EM-0025	
	Date: 11/27/97	Revision No. 3
	Page 13 of 45	

3. Weather conditions/natural phenomenon causing serious disruption of facility activities.
4. Loss of process ventilation system serving a confinement function, which results in the loss of confinement.
5. Any facility evacuation (**excluding office space**) in response to an actual occurrence, not including a precautionary evacuation for an event that can be controlled and mitigated by employees or maintenance personnel assigned to the affected facility or activity.

E. Off-Normal

1. Any unplanned and unexpected change in a process condition or variable adversely affecting safety, security, environment, or health protection performance sufficient to require termination of a procedure in a reactor or non-reactor facility.
2. Any unplanned electrical outages or unexpected consequences from a planned outage which seriously disrupt normal operations of a facility and/or may prevent the facility from meeting approved operating goals.
3. Any unplanned outages of service systems (i.e., cooling water, steam, phones, communication systems, etc.) or unexpected consequences from a planned outage which disrupts normal operations for one (1) week or longer AND which adversely affect safety, security, environment or health protection performance.
4. Loss of any process ventilation system serving a confinement function which does not result in the loss of confinement.
5. Actuation of Safety Significant SSC or their alarms resulting from an actual unsafe condition. Inadvertent alarms are not required to be reported. Actuation of continuous air monitoring systems identified as Safety Significant equipment does not have to be reported if their actuation was found to be due to radon-thoron effects on the system or their actuation is expected due to maintenance tasks and other planned operations in the facility where the potential for release of radioactivity is anticipated to occur and the workers are appropriately protected. (unanticipated RDA alarm or CAM alarm with confirmed long-lived activity)

Title: EVENT CATEGORIZATION/ CLASSIFICATION PROCEDURE <i>Compliance with this procedure is mandatory while performing the activities within its scope. Only a controlled copy may be used in the performance of work.</i>	DOCUMENT NO: EM-0025	
	Date: 11/27/97	Revision No. 3
	Page 14 of 45	

7.2 ENVIRONMENTAL

1. Radionuclide Releases

A. Unusual Occurrence

1. Release of radionuclide material that violates environmental requirements in Federal permits, Federal regulations, or requirements established under DOE directives.
2. Any release that is not an Emergency as defined in DOE Order 151.1, but which requires immediate reporting (less than 4 hours) to Federal regulatory authorities. Release of a radioactive material that exceeds a federally permitted release by the amount of a Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) reportable quantity or, where no federally permitted release exists, the release exceeds the Reportable Quantity (RQ) or triggers specific action levels for an outside Federal agency.

B. Off-Normal

1. Any release of radionuclide material to controlled or uncontrolled areas that is not part of a normal monitored release and which exceeds 50% of a CERCLA RQ reportable quantity specified for such material per 40 CFR 302.
2. Any controlled release of radioactive material that occurs as a monitored part of normal operations that exceeds what historical data and/or analysis show is expected as a result of normal operations.
3. Any monitored facility or site boundary where exposure or concentration exceeds what historical data and/or analysis show is expected as a result of normal operations.
4. Any detection of a radionuclide in a sanitary or storm sewer, waste or process stream, or any holding points where such a material is not expected.
5. Any controlled, uncontrolled, or accidental release which is not classified as an Unusual Occurrence but will be reported in writing to State/local agencies in a format other than routine periodic reports.

Title: EVENT CATEGORIZATION/ CLASSIFICATION PROCEDURE <i>Compliance with this procedure is mandatory while performing the activities within its scope. Only a controlled copy may be used in the performance of work.</i>	DOCUMENT NO: EM-0025	
	Date: 11/27/97	Revision No. 3
	Page 15 of 45	

2. Release of Hazardous Substances/Regulated Pollutants/Oil

NOTE: Throughout this procedure and particularly within this Sub-Group, reporting of spills or releases of ethylene glycol and glycol ethers shall be limited only to those spills or releases in excess of 100 pounds.

A. General Emergency

1. Any actual or potential release of material to the environment that results in or could result in significant offsite consequences (e.g., need to relocate people, major wildlife kills, major wetland degradation, major aquifer contamination, need to secure downstream water supply intakes, etc).
2. Chemical Exposure (actual or projected) beyond the site boundary is \geq ERPG-2 -OR- if ERPG values are not available, Chemical Exposure (actual or projected) beyond the site boundary is \geq EPA, Level of Concern (LOC) values.

B. Site Area Emergency

1. Unplanned liquid release of a hazardous substance resulting in a major wildlife kill.
2. Chemical Exposure (actual or projected) between the facility boundary and the site boundary is \geq ERPG-2 -OR- if ERPG values are not available, Chemical Exposure (actual or projected) between the facility boundary and the site boundary is \geq EPA, Level of Concern (LOC) values.

C. Alert

Chemical Exposure (actual or projected) at the facility boundary \geq ERPG-1 and $<$ ERPG-2 -OR- if ERPG values are not available, Chemical Exposure (actual or projected) at the facility boundary \geq PEL-STEL and $<$ EPA, Level of Concern (LOC) values.

D. Unusual Occurrence

1. Release of a hazardous substance or regulated pollutant that exceeds a CERCLA RQ per 40 CFR 302 and 40 CFR 355 for chemicals and extremely hazardous substances.

Title: EVENT CATEGORIZATION/ CLASSIFICATION PROCEDURE <i>Compliance with this procedure is mandatory while performing the activities within its scope. Only a controlled copy may be used in the performance of work.</i>	DOCUMENT NO: EM-0025	
	Date: 11/27/97	Revision No. 3
	Page 16 of 45	

2. Any release that is not an Emergency as defined by DOE Order 151.1, Comprehensive Emergency Management System, but which requires immediate (less than 4 hours) reporting to Federal regulatory agencies or triggers specification action levels for an outside Federal agency.
3. Any discharge of 100 gallons or more of oil of any kind or in any form, including, but not limited to, petroleum, fuel oil, sludge, oil refuse, and oil mixed with wastes other than dredged spoil. For operations involving oil field crude or condensate, any discharge of 100 barrels or more is reportable under this criteria.

E. Off-Normal

1. Release of a hazardous substance or regulated pollutant to controlled or uncontrolled areas that is not part of a normal, monitored release and which exceeds 50% of a CERCLA RQ as specified for such material per 40 CFR 302.
2. Any discharge of greater than 42 gallons of oil of any kind or in any form, including, but not limited to, petroleum, fuel oil, sludge, oil refuse and oil mixed with wastes other than dredged spoil outside of a permitted containment area. For operations involving oil field crude oil or condensate, any discharge less than the Unusual Occurrence level but in excess of 10 barrels.
3. Any detection of a toxic or hazardous substance in a sanitary or storm sewer, waste or process stream, or any holding points where such a material is not expected to be found considering the current detection method and historical detection method used.
4. Any controlled, uncontrolled, or accidental release not classified as an Unusual Occurrence but which will be reported in writing to State/local agencies in a format other than routine periodic reports.
5. Any controlled release of hazardous/regulated material that occurs as a monitored part of normal operations but exceeds what historical data and/or analysis shows is expected as a result of normal operations.
6. Any general environmental monitoring where concentration increases to a level which exceeds what historical data and/or analysis shows is expected as a result of normal operations.

Title: EVENT CATEGORIZATION/ CLASSIFICATION PROCEDURE <i>Compliance with this procedure is mandatory while performing the activities within its scope. Only a controlled copy may be used in the performance of work</i>	DOCUMENT NO: EM-0025	
	Date: 11/27/97	Revision No. 3
	Page 17 of 45	

3. Hazardous Material Contamination

A. Unusual Occurrence

1. Discovery of onsite or offsite contamination due to DOE operations that does not represent an immediate threat to the public, but exceeds a reportable quantity for such materials per 40 CFR 302.
2. Any discovery of groundwater contamination due to DOE operations that is not part of an existing plume previously identified in either an annual report or in any CERCLA/RCRA activity or report.

B. Off-Normal

Discovery of onsite contamination due to DOE operations that exceeds 50% of a reportable quantity for such material per 40 CFR 302.

4. Ecological Resources

Unusual Occurrence

Any occurrence causing significant impact to any ecological resource for which the DOE is a trustee (i.e., destruction of a critical habitat, damage to a historic/archeological site, damage to wetlands, etc.).

5. Environmental Agreement/Compliance Activities

A. Unusual Occurrence

Any occurrence under any agreement or compliance area that requires notification of an outside regulatory agency within 4 hours or less, or triggers an outside regulatory agency action level.

B. Off-Normal

1. Any agreement, compliance, remediation, or permit- mandated activity for which formal notification of enforcement has been received from the relevant outside regulatory agency that a site/facility is considered to be in noncompliance with a schedule or requirement (e.g. Notice of Violation, Notice of Deficiency, Notice of Intent to Sue, Notice of Noncompliance, Warning Letter, Finding of Violation, Finding of Alleged Violation, or a similar type of enforcement action).

Title: EVENT CATEGORIZATION/ CLASSIFICATION PROCEDURE <i>Compliance with this procedure is mandatory while performing the activities within its scope. Only a controlled copy may be used in the performance of work.</i>	DOCUMENT NO: EM-0025	
	Date: 11/27/97	Revision No. 3
	Page 18 of 45	

2. Any occurrence under any agreement or compliance area that will be reported to outside agencies in a format other than routine periodic reports.

7.3 PERSONNEL SAFETY

1. Occupational Illness/Injuries

A. Unusual Occurrence

1. Any occurrence due to DOE operations resulting in a fatality, terminal injury, or illness.
2. Any one occurrence resulting in three (3) or more lost workday cases as defined by 29 CFR 1904.12 and Office of Management and Budget (OMB) No. 1200-0029.
3. Any occurrence requiring in-patient hospitalization of three (3) or more personnel or that has a high probability of resulting in a permanent disability.
4. Personnel exposures to sufficient levels of hazardous substances or hazards that require the administration of medical treatment on the same work day as the exposure and are above limits established by the Occupational Safety & Health Act (OSHA) (refer to 29 CFR 1910) or American Conference of Governmental Industrial Hygienist (ACGIH), whichever is lower. These should include: noise, non-ionizing radiation, chemical agents, physical agents, or biological agents.
5. Exposures to an immediately dangerous to life and health (IDLH)(as defined by 29 CFR 1910.120) condition without both appropriate personal protective equipment and procedures in place.

B. Off-Normal

1. Any occupational illness or injury that results in inpatient hospitalization.
2. Series of occupational illness from one event involving three (3) or more people where at least one is a lost work day case.

Title: EVENT CATEGORIZATION/ CLASSIFICATION PROCEDURE <i>Compliance with this procedure is mandatory while performing the activities within its scope. Only a controlled copy may be used in the performance of work.</i>	DOCUMENT NO: EM-0025	
	Date: 11/27/97	Revision No. 3
	Page 19 of 45	

3. Personnel exposure in a single event to hazardous substances or hazards in excess of limits, as established by the OSHA (refer to 29 CFR 1910) or ACGIH whichever is lower. These should include: noise, non-ionizing radiation, chemical agents, physical agents, biological agents.

2. Vehicular Incidents

NOTE: For incidents involving Transportation of DOE Hazardous Material WITHOUT INJURIES (e.g., those involving hazardous or radioactive material or financial loss) refer to Group 6, Transportation, or Group 7, Value Based Reporting.

A. Unusual Occurrence

1. Any vehicular incident resulting in fatality(ies), injury(ies), or illness classified under Group 3, Section A - Unusual Occurrence requirements.
2. Any vehicle incident involving Departmental property with a fatality(ies) to a person(s) other than DOE personnel or DOE contractor personnel.

B. Off-Normal

1. Any vehicular incident with injury(s) involving Departmental property resulting in a lost workday case.
2. Any vehicular incident involving Departmental property with injury(s) to a person(s) other than DOE personnel or DOE contractor personnel.

3. Safety Concerns

A. Off-Normal

1. approved use of flammable, toxic, explosive, corrosive, or other unsafe or dangerous processes, chemicals, materials, or methods not in accordance with standard operating procedures or work plans.

NOTE: In the following step, SHUTDOWN is defined as a significant curtailing of activities in a facility, process or operation because of OSHA violations that requires specific corrective actions be initiated prior to resuming operations.

Title: EVENT CATEGORIZATION/ CLASSIFICATION PROCEDURE <i>Compliance with this procedure is mandatory while performing the activities within its scope. Only a controlled copy may be used in the performance of work.</i>	DOCUMENT NO: EM-0025	
	Date: 11/27/97	Revision No. 3
	Page 20 of 45	

2. Any shutdown of a work activity taken as a result of an OSHA violation (e.g., trenching without adequate shoring or working at elevated levels without fall protection, when required).

7.4 PERSONNEL RADIATION PROTECTION

1. Radiation Exposure

NOTE: Unless specified otherwise, all doses specified in the following requirements are calculated as the Total Effective Dose Equivalent (TEDE), which is the sum of the Committed Effective Dose Equivalent (CEDE) due to radionuclides taken into the body (internal exposure) and the effective dose equivalent due to external exposure.

A. General Emergency

Unplanned release of radioactive material projected to result in an exposure at the site boundary of ≥ 1 rem or ≥ 5 rem thyroid.

B. Site Area Emergency

Unplanned release of radioactive material projected to result in an exposure between the facility and site boundary ≥ 1 rem.

C. Alert

Unplanned release of radioactive material projected to result in an exposure at the facility boundary ≥ 100 mrem but, < 1 rem.

D. Unusual Occurrence

Determination of a dose that exceeds the limits specified in 10 CFR 835, Subpart C, Occupational Radiation Protection (for onsite exposure) or DOE 5400.5, Chapter II, Section 1 (for offsite exposures to a member of the public).

E. Off-Normal

1. Any single occupational exposure that exceeds an expected exposure by 100 mrem.
2. A single unplanned exposure onsite to a minor, or member of the public that exceeds 50 mrem.

Title: EVENT CATEGORIZATION/ CLASSIFICATION PROCEDURE <i>Compliance with this procedure is mandatory while performing the activities within its scope. Only a controlled copy may be used in the performance of work.</i>	DOCUMENT NO: EM-0025	
	Date: 11/27/97	Revision No. 3
	Page 21 of 45	

3. Determination of a dose that exceeds the reporting requirements thresholds specified in DOE 5400.5, Chapter II, Section 7, for offsite exposures to a member of the public.

2. Personnel Contamination

A. Unusual Occurrence

1. Any single occurrence resulting in the contamination of five or more personnel or clothing (excluding protective clothing) measured (prior to washing or decontamination) in accordance with DOE Radiological Control Manual, Article 338, or equivalent, at a level exceeding the values for total contamination limits identified in 10 CFR 835, Occupational Radiation Protection, Appendix D. The contamination level shall be based on direct measurement and not averaged over any area.
2. Any occurrence requiring offsite medical assistance for contaminated personnel.
3. Identification of personnel or clothing contamination offsite due to DOE operations in accordance with approved radiological procedures for determining personnel and/or clothing contamination, measured (prior to washing or decontamination) in accordance with the Radiological Control Manual, Article 338, or equivalent.

B. Off-Normal

1. Any measurement of personnel or clothing (excluding protective clothing) at a level equal to or exceeding five (5) times the total contamination limits identified in 10 CFR 835, Occupational Radiation Protection, Appendix D, measured (prior to washing or decontamination) in accordance with the DOE Radiological Control Manual Article 338, or equivalent. The contamination level shall be based upon direct measurement and not averaged over any area.

NOTE: The Reporting limit of 500 dpm alpha/100 cm² is applicable for any alpha emitting radionuclide whose limit from 10 CFR 835, Occupational Radiation Protection, Appendix D, is 500 dpm/100 cm² or less.

Title: EVENT CATEGORIZATION/ CLASSIFICATION PROCEDURE <i>Compliance with this procedure is mandatory while performing the activities within its scope. Only a controlled copy may be used in the performance of work.</i>	DOCUMENT NO: EM-0025	
	Date: 11/27/97	Revision No. 3
	Page 22 of 45	

2. Any measurement of personnel or clothing contamination (excluding protective clothing) at a level exceeding, but less than five (5) times the total contamination limits identified in 10 CFR 835, Occupational Radiation Protection, Appendix D, measured (prior to washing or decontamination) in accordance with the DOE Radiological Control Manual Article 338, or equivalent. The contamination level shall be based upon direct measurement and not averaged over any area.

NOTE: The Reporting limit of 500 dpm alpha/100 cm² is applicable for any alpha emitting radionuclide whose limit from 10 CFR 835, Occupational Radiation Protection, Appendix D, is 500 dpm/100 cm² or less.

7.5 SAFEGUARDS AND SECURITY

NOTE: For the purpose of this group of reportable occurrences, the term "onsite" applies to all facilities, installations, and real property subject to the jurisdiction or administration of the DOE or in its custody and posted with notices of prohibitions and penalties.

1. Criminal Acts

NOTE: Initial notification of events in this section shall follow normal occurrence reporting timeliness. When reporting an occurrence that is the subject of an ongoing investigation under this subgroup, the report shall be tailored to prevent jeopardizing the investigation. Full reporting may be delayed until completion of criminal investigations, if the reports would jeopardize the investigation.

A. Site Area Emergency

1. Bomb related incidents: detonation, location of actual device, or suspicious device resulting in a credible bomb threat.
2. An actual sabotage event or credible sabotage threat.
3. An actual terrorist attack or credible terrorist threat.

B. Alert

Extortion/kidnaping of DOE or DOE contractor personnel.

C. Unusual Occurrence

1. At DOE reactor or non-reactor nuclear facilities:
 - A. Bomb-related incidents, including location of a suspicious device or a non-credible bomb threat;
 - B. A non-credible terrorist threat;

Title: EVENT CATEGORIZATION/ CLASSIFICATION PROCEDURE <i>Compliance with this procedure is mandatory while performing the activities within its scope. Only a controlled copy may be used in the performance of work.</i>	DOCUMENT NO: EM-0025	
	Date: 11/27/97	Revision No. 3
	Page 23 of 45	

C. A non-credible sabotage threat or breach/attempted breach of a secure/classified facility;

1. Violent assault/battery, murder, or unjustified use of deadly force while on DOE property.
2. Theft/diversion/intentional destruction of Government property for property valued greater than \$1,000,000.
3. Racketeering or other organized criminal activity.

D. Off-Normal

1. At DOE facilities other than reactor or non-reactor nuclear facilities
 - A. Location of a suspicious device or a non-credible bomb threat;
 - B. non-credible terrorist threat;
 - C. non-credible sabotage threat;
2. Theft/diversion/intentional destruction of Government property valued between \$10,000 and \$1,000,000.
3. Onsite felony conspiracies (i.e., blackmail, fraud, embezzlement, extortion and forgery) not involving classified information.

2. Substance Abuse

NOTE: Off-Normal - Discovery of the prohibited use, possession or involvement of alcohol or illegal drugs by personnel within a facility that may affect facility operations.

- A. Any reportable occurrence at least partially attributable to the use of alcohol or illegal drugs (e.g., post-occurrence testing for individuals involved in occurrences meeting the threshold described in DOE 10 CFR 707 or for motor vehicle operators involved in accidents meeting the threshold described in DOT 40 CFR 382).
- B. A detection of personnel not fit for duty attributable to the use of alcohol or illegal drugs. Reasonable suspicion testing will be done for any individual, where there is reasonable suspicion of substance abuse.

Title: EVENT CATEGORIZATION/ CLASSIFICATION PROCEDURE <i>Compliance with this procedure is mandatory while performing the activities within its scope. Only a controlled copy may be used in the performance of work.</i>	DOCUMENT NO: EM-0025	
	Date: 11/27/97	Revision No. 3
	Page 24 of 45	

3. Intelligence Activities

A. Unusual Occurrence

1. Extortion/blackmail directed at DOE or DOE contractor personnel with intent of obtaining detailed information concerning plant processes/configurations, or aiding in sabotage or terrorist acts.
2. Espionage, intelligence activities, treason, or subversive activities by or directed at DOE or DOE contractor personnel.

B. Off-Normal

1. When illegal or unauthorized access is sought to classified or sensitive information, technology, or special nuclear materials.
2. When DOE or DOE contractor personnel believe that they may be the target of an attempted exploitation by an inimical interest, foreign or domestic.

4. Physical Security System Computer

A. Unusual Occurrence

1. Actual/attempted unauthorized access to classified or sensitive unclassified information.
2. Discovery of a computer incident (virus, hacker, sniffer, abuse, fraud, etc.) Involving a physical security system that causes an alteration to a security feature, disruption of service, or loss of the confidentiality, integrity or availability of information and results in an estimated \$1,000,000 or more in damages or the cost of restoring services.

B. Off-Normal

Discovery of a computer incident (virus, hacker, sniffer, abuse, fraud, etc.) Involving a physical security system that causes an alteration to a security feature, disruption of service, or loss of the confidentiality, integrity or availability of information and results in an estimated \$10,000 or more in damages or the cost of restoring services.

Title: EVENT CATEGORIZATION/ CLASSIFICATION PROCEDURE <i>Compliance with this procedure is mandatory while performing the activities within its scope. Only a controlled copy may be used in the performance of work.</i>	DOCUMENT NO: EM-0025	
	Date: 11/27/97	Revision No. 3
	Page 25 of 45	

5. Unplanned/Unscheduled Outage of Site Security System

A. Unusual Occurrence

Unplanned/unscheduled outage of any site security system, or major component of a site security system, that is not redundant and/or results in a potential vulnerability which would allow unauthorized, or undetected access to Protected Areas, Exclusion Areas, Material Access Areas, and Sensitive Compartmented Information Facilities.

B. Off-Normal

Unplanned/unscheduled outage of any site security system or major component of a site security system, not encompassed by the Unusual Occurrence category, that is not redundant and not authorized by a facility shutdown plan or a special security plan approved by DOE that requires the physical presence of the protective force as a compensatory measure to prevent unauthorized access. This does not include the stationing of protective forces as a backup security system identified in a DOE-approved facility security plan.

6. Demonstrations/Protests

A. Unusual Occurrence

1. Disruptive activities impeding vehicular or employees access/egress.
2. Attempted or actual trespass.
3. Malevolent activities causing property damage or bodily harm.

B. Off-Normal

Lawful activities warranting deployment of additional protective measures.

7. Firearms

A. Unusual Occurrence

Unauthorized firearms discharge resulting in personnel injury.

B. Off-Normal

Unauthorized firearms discharged resulting in no personnel injury:

Title: EVENT CATEGORIZATION/ CLASSIFICATION PROCEDURE <i>Compliance with this procedure is mandatory while performing the activities within its scope. Only a controlled copy may be used in the performance of work.</i>	DOCUMENT NO: EM-0025	
	Date: 11/27/97	Revision No. 3
	Page 26 of 45	

8. Other Security Concerns

A. Alert

Occurrence which depletes or overtaxes onsite response forces and requires offsite tactical response assistance.

B. Unusual Occurrence

Unauthorized use, possession, alterations of a security badge, credential, shield, or other form of official identification (to include blank badge stock/forms) to gain access to a protected area or limited area.

C. Off-Normal

1. Discovery of prohibited items within a Protected Area that:

- A. are suspected of being positioned for the purpose of aiding and abetting a malevolent act; or
- B. are, of themselves, illegal.

NOTE: Items discovered outside controlled areas that are legal under Federal, State, and local laws are not reportable, even if the discovery of such items would otherwise be reportable under this paragraph.

- 2. Onsite death of cleared DOE or DOE contractor personnel by unnatural causes (e.g., suicide, drug overdose).
- 3. Loss of security badges in excess of 5% in a calendar year.
- 4. Onsite malicious mischief, disorderly conduct, or vandalism which disrupts plant activity or causes damage between \$10,000 and \$100,000.

9. Material Control and Accountability

A. Unusual Occurrence

- 1. Evidence that special nuclear material balance data has been manipulated or falsified to mask a diversion or theft or to alter loss detection sensitivity.
- 2. Loss or apparent loss whenever a State, local government, or other Federal agency must be notified.

Title: EVENT CATEGORIZATION/ CLASSIFICATION PROCEDURE <i>Compliance with this procedure is mandatory while performing the activities within its scope. Only a controlled copy may be used in the performance of work.</i>	DOCUMENT NO: EM-0025	
	Date: 11/27/97	Revision No. 3
	Page 27 of 45	

B. Off-Normal

1. Alarms or other indicators, excluding inventory differences or shipper-receiver differences, from loss detection elements for Category III and IV material balance areas that cannot be proven to be false within 24 hours.
2. A special nuclear materials or tritium inventory difference (loss or gain) that exceeds the alarm limits, does not involve the loss of an item, and is a Category III or IV quantity of material.
3. A shipper-receiver difference that exceeds 200 grams of fissile material and the combined limit of error for the shipment.
4. A special nuclear materials or tritium shipper-receiver difference involving a gain in the number of items for which the items total a Category III or IV quantity of material.
5. Any unexpected accumulation of fissile material within primary confinement boundaries.
6. A statistically significant trend in total inventory difference for special nuclear material or tritium inventories.
7. Loss or apparent loss of one or more items for which the items total a Category IV quantity of Special Nuclear Materials or any loss of one or more containers of tritium that does not meet the threshold for an Unusual Occurrence (includes item losses due to shipper-receiver differences).

7.6. TRANSPORTATION

NOTE: Shippers are responsible for occurrences involving their shipments. DOE organizations receiving hazardous materials, which are not in compliance with appropriate requirements, from a DOE shipper must report the discrepancies to the DOE shipper who will prepare an Occurrence Report in accordance with this procedure and implement suitable corrective actions. If an out-of compliance shipment is received from a non-DOE shipper, the DOE-recipient will notify the non-DOE shipper of the apparent noncompliance and will prepare an Occurrence Report in accordance with this procedure. The report must contain a statement that the non-DOE shipper has been notified and identify any corrective actions taken or planned to eliminate the occurrence from being repeated.

NOTE: The term "limited quantity" as used in this Group is defined by 49 CFR 171.8.

Title: EVENT CATEGORIZATION/ CLASSIFICATION PROCEDURE <i>Compliance with this procedure is mandatory while performing the activities within its scope. Only a controlled copy may be used in the performance of work.</i>	DOCUMENT NO: EM-0025	
	Date: 11/27/97	Revision No. 3
	Page 28 of 45	

NOTE: Transportation occurrences are incidents related to the transportation of DOE materials, including hazardous materials, hazardous substances, and hazardous wastes by vehicular, vessel, air, or rail mode. During an offsite transportation occurrence the control zone area will be considered the same as the onsite area.

NOTE: DOE facilities receiving materials from a DOE shipper that are not in compliance with appropriate regulations, must report the discrepancies to the DOE shipper who will prepare an Occurrence Report and implement suitable corrective actions. If such a shipment is received from a non-DOE shipper and meets the reporting criteria, the DOE organization will notify the non-DOE shipper of the apparent noncompliance and will prepare an Occurrence Report stating that the non-DOE shipper has been notified. These reporting criteria are in addition to any required by DOT for contractors subject to the DOT regulations.

1. General Emergency

Any actual or potential release of material to the environment that results in or could result in significant offsite consequences (e.g., need to relocate people, major wildlife kills, major wetland degradation, major aquifer contamination, need to secure downstream water supply intakes, etc).

2. Site Area Emergency

A. Any release of radionuclide material outside the control zone area of a reportable quantity of a hazardous substance (per 49 CFR 171.8) which is transported in support of Departmental operations.

B. Unplanned liquid release of a hazardous substances resulting in a major wildlife kill.

3. Alert

A. Any release of radionuclide material in the control zone area of a reportable quantity of a hazardous substance (per 49 CFR 171.8) which is transported in support of Departmental operations.

B. Any release of hazardous substances or regulated pollutants of a hazardous substance (per 49 CFR 171.8) which is transported in support of Departmental operations.

4. Unusual Occurrence

A. Any packaging or transportation activity (including loading, unloading, or temporary storage) involving the offsite release of radioactive material, etiologic agents, a reportable quantity of hazardous substance, or marine pollutants.

Title: EVENT CATEGORIZATION/ CLASSIFICATION PROCEDURE <i>Compliance with this procedure is mandatory while performing the activities within its scope. Only a controlled copy may be used in the performance of work.</i>	DOCUMENT NO: EM-0025	
	Date: 11/27/97	Revision No. 3
	Page 29 of 45	

- B. Any shipment of radioactive material that arrives at its destination with radiation or contamination levels greater than DOT limits, or results in personnel radiation exposure higher than permitted in Federal permits, Federal regulation, or DOE standards.
- C. Any shipment or onsite transfer of radioactive material or hazardous waste that arrives at its destination with an unaccounted for package or an irreconcilable shipping paper, waste manifest, or onsite transfer authorization.
- D. A vehicle, vessel, rail, or air incident or accident (without personnel injury) that presents significant impact on the ability of a facility to conduct transportation operations and:
 - 1. results in release of radioactive or hazardous materials above Federal permit, Federal regulatory, or DOE Standard Limits;
 - 2. involves performance degradation of safety equipment; or
 - 3. is the result of failure or degradation of administrative controls required to ensure safety.
- E. Violations of the Federal Motor Carrier Safety Regulations or the Hazardous Materials Regulations, if those violations are determined by DOT inspection and result in a fine (monetary penalty).

5. Off-Normal

- A. Any packaging or transportation activity involving:
 - 1. the offsite release of non-radioactive hazardous material, or any quantity of the hazardous waste; or
 - 2. the onsite release of radioactive materials, etiologic agents, hazardous substances, hazardous waste, or marine pollutants.
- B. A vehicle, vessel, rail or air incident or accident (without personal injury) that affects the ability of a facility to conduct transportation operations and:
 - 1. results in release of radioactive or hazardous materials below limits established by Federal permits, Federal regulations, or DOE Standard limits, but must be reported to State or local agencies; or
 - 2. is the result of operational procedural violations, including maintenance or administrative procedures.

Title: EVENT CATEGORIZATION/ CLASSIFICATION PROCEDURE <i>Compliance with this procedure is mandatory while performing the activities within its scope. Only a controlled copy may be used in the performance of work.</i>	DOCUMENT NO: EM-0025	
	Date: 11/27/97	Revision No. 3
	Page 30 of 45	

- C. Noncompliances (potential violations) of the DOT Hazardous Materials Regulations or the transportation and packaging requirements of the Nuclear Regulatory Commission involving:
 - 1. errors made by the shipper in materials description, marking, labeling, or placarding;
 - 2. an unqualified person signing shipping papers;
 - 3. the highway routing selection requirements for highway route controlled shipments or the notification requirements for spent-fuel shipments not being observed;
 - 4. the separation and segregation tables for hazardous materials not strictly adhered to; or
 - 5. the applicable packaging requirements for the assembly, handling, or selection of a package not being in accordance with the applicable regulations.
- D. Noncompliances (potential violations) of the Federal Motor Carrier Safety Regulations involving:
 - 1. a contractor driver operating a DOE-owned motor vehicle after a positive drug test or failure of an alcohol test;
 - 2. an unqualified driver operating a vehicle (medical, driver's license, or training not in compliance);
 - 3. the carrier (contractor management) not having required insurance;
 - 4. a vehicle that failed inspection not being removed from service;
 - 5. a specification cargo tank with expired inspection being in service with hazardous materials;
 - 6. a driver's log book deliberately misrepresented; or
 - 7. the carrier (contractor management) failing to perform random or periodic drug or substance-abuse testing.
- E. Any violation of the Hazardous Material Regulations or Federal Motor Carrier Safety Regulations if that violation is determined by DOT inspection and does not result in a penalty.

Title: EVENT CATEGORIZATION/ CLASSIFICATION PROCEDURE <i>Compliance with this procedure is mandatory while performing the activities within its scope. Only a controlled copy may be used in the performance of work.</i>	DOCUMENT NO: EM-0025	
	Date: 11/27/97	Revision No. 3
	Page 31 of 45	

7.7 VALUE BASED REPORTING

NOTE: Value basis reporting includes items based on cost or the identification of defective items, materials, or services. A defective item, material, or service shall be identified and reported to allow the initiation of a Headquarters investigation and make all Departmental Elements aware of the defect and initiate actions to eliminate common mode failures due to substandard, counterfeit, misrepresentation, or fraudulent practices of suppliers.

1. Cost Based Occurrences

NOTE: Any occurrence specifying cost as a basis for reporting, unless otherwise stated, will be classified by the following monetary values necessary to repair, replace, or otherwise restore a facility/system/ component to acceptable operation. Costs used for reporting should be reasonable initial estimates.

A. Unusual Occurrence

Estimated loss or damage to Department of Energy (DOE) or other property amounting to \$1,000,000 or more, or estimated costs of \$1,000,000 or more required for cleaning (including decontamination), renovating; replacing, or rehabilitating structures, equipment, or property.

B. Off-Normal

Estimated loss or damage to DOE or other property amounting to between \$10,000 and \$1,000,000 (for vehicle/aircraft the lower limit is \$5,000 or, for insurance purposes, considered a total loss) or estimated costs within these limits required for cleaning (including decontamination), renovating, replacing, or rehabilitating structures, equipment, or property.

2. Defective Item, Material, or Service

NOTE: Identical items, materials, or services may be documented in a Roll-Up Report.

A. Off-Normal

1. Discovery of an actual or potential defective item, material, or service, including any suspect, counterfeit, or substandard product, in any application whose failure could result in a substantial safety hazard. Examples include the identification of counterfeit components found in:

- A. cranes, elevators and fork lifts- items used in the critical load bearing path of such handling and lifting equipment;
- B. vehicles - items used in engines, brakes, or steering mechanisms; and

Title: EVENT CATEGORIZATION/ CLASSIFICATION PROCEDURE <i>Compliance with this procedure is mandatory while performing the activities within its scope. Only a controlled copy may be used in the performance of work.</i>	DOCUMENT NO: EM-0025	
	Date: 11/27/97	Revision No. 3
	Page 32 of 45	

C. critical components used in personnel safety equipment; and

D. facilities:

1. Items used to contain radioactive fluids, high temperature or pressure steam or fluids, or other hazardous material.
2. Safety Class SSC or Safety Significant SSC supporting the safe operation or shutdown of a facility, system, or process that could result in a performance degradation.

NOTE: Guidance in the identification and follow-up actions are contained in DOE Quality Alerts or other bulletins.

2. Discovery of any actual or potential defective item, material, or service, including any suspect, counterfeit, or substandard product in any application whose failure could not result in a substantial safety hazard. This does not include office supplies, equipment, or household products.

NOTE: It is considered appropriate by the DOE subject matter expert to report identical items, materials, or services in a Roll-Up Report, as long as the occurrences meet all of the requirements for Roll-Up Reports, including DOE line management approval.

7.8 FACILITY STATUS

NOTE: This section involves the change of facility status that may affect the performance goals of a facility. The potential inability to meet performance goals may significantly affect other major and minor facilities throughout the complex. Performance goals are operating objectives necessary to accomplish an approved facility, process, or activity mission on a periodic basis. The duration of the goal may be short or long term, but should not exceed the goals of the annual operating plan.

NOTE: The underlying basis for this category is to ensure dissemination of information that may affect other DOE Facilities or programs. Therefore, in this instance, the definition for shutdown is defined as a significant curtailing of activities in a facility, process, or operation at the direction of facility program management which may affect the operations, programs or performance goals of other DOE facilities.

Title: EVENT CATEGORIZATION/ CLASSIFICATION PROCEDURE <i>Compliance with this procedure is mandatory while performing the activities within its scope. Only a controlled copy may be used in the performance of work.</i>	DOCUMENT NO: EM-0025	
	Date: 11/27/97	Revision No. 3
	Page 33 of 45	

1. Facility/Process/Activity Unscheduled Shutdown

Off- Normal Any unscheduled shutdown of a facility, process, or activity that resulted or may result in the failure to meet approved performance goals.

2. Existing Facility/Process/Activity Shutdown Extension

Off- Normal

- A. Any increase in an approved shutdown schedule of one (1) month or greater that resulted or may result in the failure to meet approved performance goals.
- B. Any delay in an approved start-up schedule of one (1) month or greater and which resulted or may result in the failure to meet approved performance goals.

3. New Facility/Process/Activity Start-up Delays

Off- Normal Any delay in an approved start-up schedule of one (1) month or greater and which resulted or may result in the failure to meet approved performance goals for a new facility, process or activity.

7.9 NUCLEAR EXPLOSIVE SAFETY - Not Applicable for FEMP

7.10 CROSS-CATEGORY ITEMS

1. Collectively Significant Related Occurrences

A. Unusual Occurrence

A series of related occurrences which individually do not warrant reporting under preceding criteria but which collectively are considered significant enough to warrant reporting as determined by the FEMP Emergency Duty Officer (EDO).

B. Off-Normal

A series of related occurrences which individually do not warrant reporting under preceding criteria, but which collectively are considered significant enough to warrant reporting as determined by FEMP Emergency Duty Officer (EDO).

2. Near Miss Occurrences

- A. Unusual Occurrence A near miss to one of the reporting classifications under preceding categories where the conditions necessary to cause an Unusual Occurrence existed (i.e., all barriers to event initiation were compromised).

Title: EVENT CATEGORIZATION/ CLASSIFICATION PROCEDURE <i>Compliance with this procedure is mandatory while performing the activities within its scope. Only a controlled copy may be used in the performance of work.</i>	DOCUMENT NO: EM-0025	
	Date: 11/27/97	Revision No. 3
	Page 34 of 45	

B. Off-Normal

1. A near miss to one of the reporting classifications under preceding categories where the conditions necessary to cause an Off-Normal Occurrence existed (i.e., all barriers to event initiation were compromised).
2. A near miss to one of the reporting classifications under preceding categories where the conditions necessary to cause a reportable occurrence were prevented from existing by one remaining barrier after other barriers had been compromised (i.e., one additional independent failure/degradation was necessary for event initiation to be possible).

3. Potential Concerns/Issues

A. Unusual Occurrence

1. An occurrence that may result in an significant concern, by the press or general population, particularly in the off-site transportation and radiological areas, by the press or general population or could damage the credibility of the Department of Energy.
2. Identification of potential concerns or issues that are deemed worthy of reporting determined by the FDF EDO.

B. Off-Normal

1. Any event resulting in the initiation of a Type A or B investigation as defined by DOE 441, Accident Investigations.
2. Identification of potential concerns or issues that are deemed worthy of reporting determined by the FDF EDO.

8.0 RECORDS

The following documents will be generated as records as a result of this procedure and will be managed according to RM-0022, FEMP Records Management Program/Records Management User Manual:

The authorized master copy of the procedure.

9.0 DRIVERS

- 9.1 DOE Order 232.1A, Occurrence Reporting and Processing of Operation Information
- 9.2 DOE Order 151.1, Comprehensive Emergency Management System
- 9.3 DOE Order 5480.19, Conduct of Operations for DOE Facilities

Title: EVENT CATEGORIZATION/ CLASSIFICATION PROCEDURE <i>Compliance with this procedure is mandatory while performing the activities within its scope. Only a controlled copy may be used in the performance of work.</i>	DOCUMENT NO: EM-0025	
	Date: 11/27/97	Revision No. 3
	Page 35 of 45	

9.4 EM-0021, Fernald Environmental Management Project (FEMP) Offsite Emergency Warning System -

9.5 FEMP RCRA Contingency Plan

10.0 DEFINITIONS

10.1 Assistant Emergency Duty Officer (AEDO) - The emergency management authority onsite when the EOC is not operational. Incident Commander of the FEMP emergency response activities. The AEDO is the Facility Manager Designee.

10.2 Business day - The normal administrative day (e.g., Monday through Friday, 0730 to 1600) in which normal work activities are conducted. It is not meant to encompass the 24 hours in a day, even if the facility is operated or maintained on a 24-hour basis.

10.3 Categorization - Relative ranking of an event or condition to ensure that the urgency of notification is readily identifiable and that the more serious occurrences are highlighted to management.

10.4 Classification - The placement of an event or condition in one of three classes under the emergency categorization. The classes are: Alert, Site Area Emergency and General Emergency.

10.5 Condition - Any as-found state, whether or not resulting from an event, that may have adverse safety, health, quality assurance, security, operational or environmental implications. A condition is more programmatic in nature; for example, an error in analysis or calculation; an anomaly associated with design or performance; an anomaly associated with design or performance; or an item indicating a weakness in the management process are all conditions.

10.6 Defective Item, Material, or Service - Any time, material, or service that does not meet the commercial standard or procurement requirements as defined in catalogues, proposals, procurement specifications, design specifications, testing requirements, contracts, or the like. It includes those items or services found, during acceptance testing, pre-operational testing, operations, inspections, or audit, not to meet the quality or reliability requirements appropriate to the use or specificity of the item or service procured. It also includes misrepresentation of the specifications or trademarks associated with the parts/service marking, packaging, or certification/identification stamps. It does not include parts or services which fail or are otherwise found to be inadequate because of random failures or errors within the accepted reliability level.

Title: EVENT CATEGORIZATION/ CLASSIFICATION PROCEDURE <i>Compliance with this procedure is mandatory while performing the activities within its scope. Only a controlled copy may be used in the performance of work.</i>	DOCUMENT NO: EM-0025	
	Date: 11/27/97	Revision No. 3
	Page 36 of 45	

10.7 **Discharge** - Includes, but is not limited to, any spilling leaking, pumping, pouring, emitting, emptying, or dumping of oil, but excludes discharges in compliance with a permit under section 402 of the Clean Water Act (CWA), discharges resulting from circumstances identified and reviewed and made a part of the public record with respect to a permit issued or modified under section 402 of the CWA, and subject to a condition in such permit, or continuous or anticipated intermittent discharges from a point source, identified in a permit or permit application under section 402 of the CWA, that are caused by events occurring within the scope of relevant operating or treatment systems.

10.8 **Emergency** - The most serious event, consists of any unwanted, operational, civil, natural-phenomenon, or security occurrence which could endanger or adversely affect people, property or the environment. The emergency category is subdivided into three classes:

1. ALERT

- A. **Non-reactor Facilities** - Events are in progress or have occurred which involve an actual or potential substantial degradation of the level of safety of the facility. Any release of hazardous materials (radiological or non-radiological) is expected to be limited to small fractions of the appropriate Protective Action Guides (PAG) or Emergency Response Planning Guides (ERPG) exposure levels.
- B. **Safeguards and Security** - Events are in progress or have occurred which involve actual or potential substantial degradation in the level of protection of the facility or the loss or possible loss of Special Nuclear Material (SNM).
- C. **Transportation** - Events are in progress or have occurred which involve an actual or potential substantial degradation of the safety of the shipment. Any release of hazardous materials (radiological or non-radiological) is expected to be limited to small fractions of the appropriate Protective Action Guides (PAG) or Emergency Response Planning Guides (ERPG) exposure levels.

2. SITE AREA EMERGENCY

- A. **Non-reactor Facilities** - Events are in progress or have occurred which involve actual or likely major failures of facility functions needed for the protection of workers and the public. Any release of hazardous materials (radiological or non-radiological) is expected to exceed the appropriate PAG or ERPG exposure levels onsite, but is not expected to exceed the appropriate PAGs or ERPGs offsite.
- B. **Safeguards and Security** - Events are in progress or have occurred which involve actual malevolent acts resulting in major failures of protective systems.

Title: EVENT CATEGORIZATION/ CLASSIFICATION PROCEDURE <i>Compliance with this procedure is mandatory while performing the activities within its scope. Only a controlled copy may be used in the performance of work.</i>	DOCUMENT NO: EM-0025	
	Date: 11/27/97	Revision No. 3
	Page 37 of 45	

- C. **Transportation** - Events are in progress or have occurred which involve an actual or potential major reduction in the safety of the shipment. Any release of hazardous materials (radiological or non-radiological) is expected to exceed appropriate PAG or ERPG exposure levels in the immediate vicinity of the accident or incident, but is not expected to exceed the appropriate PAGs or ERPGs in a general public.

3. GENERAL EMERGENCY

- A. **Non-reactor Facilities** - Events are in progress or have occurred that involve actual or imminent catastrophic reduction of facility safety systems with potential for loss of containment or confinement integrity, and/or release of hazardous materials (radiological or non-radiological) that can reasonably be expected to exceed appropriate PAG or ERPG exposure levels offsite.
- B. **Safeguards and Security** - Events are in progress or have occurred which involve malevolent action resulting in catastrophic degradation of protection systems that could lead to substantial offsite impacts.
- C. **Transportation** - Events have occurred which involve an actual or imminent catastrophic reduction in the safety of the shipment. Any release of hazardous materials (radiological or non-radiological) is expected to exceed appropriate PAG or ERPG exposure levels in a general public area. If the event has occurred on a DOE site, the release is expected to exceed the appropriate PAG or ERPG exposure levels offsite.

- 10.9 **Emergency Duty Officer (EDO)** - The trained, senior management representative responsible for the management and oversight of the FEMP. Responsible for event categorization.
- 10.10 **Event** - Something significant and real-time that happens (e.g., pipe break, valve failure, loss of power, environmental spill, earthquake, tornado, flood).
- 10.11 **Facility** - Any equipment, structure, system, process, or activity that fulfills a specific purpose. Examples include accelerators, storage areas, fusion research devices, nuclear reactors, production or processing plants, coal conversion plants, windmills, radioactive waste disposal systems and burial grounds, testing laboratories, research laboratories, transportation activities, and accommodations for analytical examination of irradiated and unirradiated components.
- 10.12 **Facility Boundary** - The corresponding structural or geographical boundaries which encompass all buildings, structures, support equipment, and auxiliary systems that support a common mission. (See attached map for FEMP facility boundaries.)

Title: EVENT CATEGORIZATION/ CLASSIFICATION PROCEDURE <i>Compliance with this procedure is mandatory while performing the activities within its scope. Only a controlled copy may be used in the performance of work.</i>	DOCUMENT NO: EM-0025	
	Date: 11/27/97	Revision No. 3
	Page 38 of 45	

10.13 Facility Manager - That individual, or designee, usually, but not always a contractor with direct line responsibility for operation of a facility or group of related facilities, including authority to direct physical changes to the facility. For purposes of this procedure, a Facility Manager could also be responsible for programs or activities.

10.14 Federally Permitted Release - Any release that satisfies the definition of "federally permitted release" in 40 CFR 302.3.

10.15 General Public or Member of the Public - Persons who are not occupationally associated with the DOE facility or operations, i.e., persons whose assigned occupational duties does not require them to enter the DOE site.

10.16 Hazardous Substances or Materials

1. Department of Energy Office of Safeguards and Security Hazardous Material definition: Any solid, liquid or gaseous material that is chemical, toxic, flammable, radioactive, or unstable upon prolonged storage and that exists in quantities that could pose a threat to life, property, or the environment.
2. Department of Transportation Hazardous Materials (see 49 CFR 171.8 and 172.101) definition: A substance or material, including a hazardous substance, which has been determined by the Secretary of Transportation to be capable of posing an unreasonable risk to health, safety, and property when transported in commerce and which has been so designated.
3. Environmental Protection Agency (EPA) Hazardous Substances (see 40 CFR 302 and 40 CFR 117) definition: For purposes of transportation, see 49 CFR 171.8 and 172.101.
4. Environmental Protection Agency hazardous Wastes (see 40 CFR 261 and 40 CFR 262) definition: Any material that is subject to the Hazardous Waste Manifest Requirements of EPA. For purposes of transportation, see 49 CFR 171.8
5. Occupational Safety and Health Administration (OSHA) Hazardous Chemical (see CFR 1910.1000 and 29 CFR 1910.1200) definition: Any chemical which is a physical or health hazard.
6. Superfund Amendments and Reauthorization Act (SARA) Extremely Hazardous Substances (see 40 CFR 355) definition: These are not defined but appear on a list in Appendix A and B of 40 CFR 355.

10.17 Impairment - Any pre/unplanned reduction or loss of redundancy in the capabilities of equipment or the capabilities of the emergency system. Impairments can be the result of physical damage such as severed or shorted wiring, software/programming errors, or physical damage. Impairments do occur even though the equipment is still operable.

Title: EVENT CATEGORIZATION/ CLASSIFICATION PROCEDURE <i>Compliance with this procedure is mandatory while performing the activities within its scope. Only a controlled copy may be used in the performance of work.</i>	DOCUMENT NO: EM-0025	
	Date: 11/27/97	Revision No. 3
	Page 39 of 45	

- 10.18 Item - An all-inclusive term used in place of the following: appurtenance, sample, assembly, component, equipment, material, module, part, structure, subassembly, subsystem, system, unit or support systems, documented concepts, or data. When used in reference to nuclear material, a visible, single piece or container of nuclear material with a unique identification and known nuclear material mass.
- 10.19 Lessons Learned - A "good work practice" or innovative approach that is identified and shared, or an adverse work practice or experience that is shared to avoid recurrence.
- 10.20 Loggable Event - A non-routine event which is not required to be reported to DOE. It must, however, be recorded (along with all events of higher classification) in a log maintained and reviewed as a part of the functional appraisal process.
- 10.21 Lost Workdays - The number of days (consecutive or not) after, but not including, the day of injury or illness during which the employee would have worked but could not do so; that is, could not perform all or any part of his/her normal assignment during all or any part of the workday or shift because of the occupational injury or illness.
- 10.22 Non-reactor Facility
1. Those activities or operations that involve radioactive and/or fissionable materials in such form and quantity that a significant nuclear hazard potentially exists to employees or the general public. Included are activities or operations that: a) produce, process, or store radioactive liquid or solid waste, fissionable materials, or tritium; b) conduct separations operations; c) conduct irradiated materials inspection, fuel fabrication, decontamination, or recovery operations; d) conduct fuel enrichment operations; or e) perform environmental remediation or waste management activities involving radioactive materials.
 2. Incidental use and generating of radioactive materials in a facility operation (e.g., check and calibration sources, use of radioactive sources in research and experimental and analytical laboratory activities, electronic microscopes, and X-ray machines) would not ordinarily require the facility to be included in this definition. Accelerators and reactors, and their operations are not included. The application of any rule to a non-reactor nuclear facility should be applied using a graded approach.
- 10.23 Notification Report - The initial documented report, to the Department of Energy, of an event or condition that meets the reporting criteria defined in the Occurrence Reporting Requirements Documents.
- 10.24 Nuclear Facility - Reactor and non-reactor nuclear facilities.
- 10.25 Occurrence - An event or a condition that adversely affects, or may adversely affect, DOE or contractor personnel, the public, property, the environment, or the DOE mission. Events or conditions meeting the criteria threshold identified in DOE M 232.1-1A are occurrences.

Title: EVENT CATEGORIZATION/ CLASSIFICATION PROCEDURE <i>Compliance with this procedure is mandatory while performing the activities within its scope. Only a controlled copy may be used in the performance of work.</i>	DOCUMENT NO: EM-0025	
	Date: 11/27/97	Revision No. 3
	Page 40 of 45	

- 10.26 **Occurrence Investigation** - An investigation conducted according to site specific procedures and/or when determined by DOE that a Type A or B is required by DOE procedures.
- 10.27 **Occurrence Report** - A documented evaluation of an event or condition that is prepared in sufficient detail to enable the reader to assess its significance, consequences, or implications and to evaluate the actions being proposed or employed to correct the condition or to avoid recurrence.
- 10.28 **Off-Normal Occurrence** - Abnormal or unplanned events or conditions, as described in DOE 232.1-1, that adversely effect, potentially affect or indicate degradation in the safety, security, environmental or health protection performance or operation of a facility.
- 10.29 **Offsite** - All areas outside the boundaries of the DOE property line.
- 10.30 **Offsite Transportation Event** - Involves movement of materials which are considered to be in commerce, thus requiring compliance with DOT Hazardous Materials Regulations.
- 10.31 **Oil** - Oil of any kind or in any form, including but not limited to, petroleum, fuel oil, sludge, oil refuse, and oil mixed with wastes other than dredge spoil.
- 10.32 **Onsite** - All areas of the FEMP inside the DOE property line.
- 10.33 **Onsite Transportation Event** - Involves movement of materials that are not in commerce, thus are transported in accordance with DOE onsite safety requirements.
- 10.34 **Performance Degradation** - Failure or degradation of a facility, process, system or component that reduces the reliability of critical components of the facility whose loss or degradation prevents the system from performing its intended function. Performance degradation does not include a) a burned-out power indicator light on a piece of radiation monitoring equipment which does not prevent the equipment from detecting elevated radiation levels and alarming as designed; 2) a pieces of equipment that is determined to be out of calibration on the conservative side (such as a low level alarm that alarms at a higher value that it should); or 3) the temporary loss of a component where redundant components are maintained operable or in operation and the authorization basis is not compromised.
- 10.35 **Primary Confinement** - Provides confinement of hazardous material to the vicinity of its processing. This confinement is typically provided by piping, tanks, glove boxes, encapsulating material, and the like, along with any offgas systems that control effluent from within the primary confinement.
- 10.36 **Primary Environmental Monitors** - Monitoring equipment required to legally monitor ongoing discharges. In general, this term applies to monitors used closest to the point of discharge to determine if discharges are within specific limits. It also includes any equipment that actuates automatically in response to set level signals from such a monitor. It does not include equipment in general area, remediation or compliance monitoring programs.

Title: EVENT CATEGORIZATION/ CLASSIFICATION PROCEDURE <i>Compliance with this procedure is mandatory while performing the activities within its scope. Only a controlled copy may be used in the performance of work.</i>	DOCUMENT NO: EM-0025	
	Date: 11/27/97	Revision No. 3
	Page 41 of 45	

- 10.37 Program Manager - The DOE Headquarters individual or designee, designated by and under the direction of a Secretarial Officer, who is directly involved in the operation of facilities under his or her cognizance, and holds signature authority to provide technical direction through heads of Field Elements/Operations Offices to operating personnel for these facilities.
- 10.38 Program Significant Cost - Meets the criteria of Category 7, Value Basis Reporting.
- 10.39 Program Significant Delay - Meets the criteria of Category 8, Facility Status.
- 10.40 Release - Any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or otherwise disposing of substances into the environment. This includes abandoning/discarding any type of receptacle containing substances in an unenclosed containment structure but does not include permitted containment structures.
- 10.41 Reportable Occurrence - Events or conditions to be reported in accordance with the criteria defined in the Occurrence Reporting Requirements Documents.
- 10.42 Reportable Quantity - For any CERCLA hazardous substances, including radionuclides and Superfund Amendments and Reauthorization Act Title 3 extremely hazardous substances, with quantities established in 40 CFR Part 302 and Part 355 respectively, the release of which requires notification unless Federally permitted.
- 10.43 Safety Class Structures, Systems, or Components (Safety Class SSCs) - Nuclear facility systems, structures, or components including primary environmental monitors and portions of process systems, whose failure could adversely affect the environment or safety and health of the public identified by safety analyses. [DOE 5480.30]
- 10.44 Safety Significant Structures, Systems, or Components (Safety Significant SSCs)

NOTE: Safety Significant SSC, as used in this procedure, distinguishes a specific category of SSCs other than Safety Class SSCs. It should not be confused with the generic modifier "safety significant" used in DOE Orders (e.g., DOE 5480.23).

1. Nuclear facility structures, systems, or components not designated as Safety Class SSCs but whose preventative or mitigative function is a major contributor to defense in depth (i.e., prevention of uncontrolled hazardous material release) and/or worker safety as determined from hazard analysis. [DOE-STD-3009-94]
2. Non-nuclear facility structures, systems or components whose preventative or mitigative function is a major contributor to defense in depth (i.e., prevention of uncontrolled hazardous material release) and/or worker safety.

Title: EVENT CATEGORIZATION/ CLASSIFICATION PROCEDURE <i>Compliance with this procedure is mandatory while performing the activities within its scope. Only a controlled copy may be used in the performance of work.</i>	DOCUMENT NO: EM-0025	
	Date: 11/27/97	Revision No. 3
	Page 42 of 45	

- 10.45 Service - The performance of work, such as design, construction, fabrication, inspection, nondestructive examination/testing, environmental qualification, equipment qualification, repair, installation, or the like.
- 10.46 Significant Performance Degradation - Degradation that compromises the facility minimum authorization bases for the operational condition at the time of the occurrence or allows an unmonitored release that is not immediately mitigated.
- 10.47 Site Boundary - The area over which DOE has access control authority. The DOE, government-owned property line. All facility boundaries are totally encompassed within the site boundary.
- 10.48 Special Nuclear Material - (1) Plutonium, uranium-233, uranium enriched in the isotope 233 or in the isotope 235, and any other material that the Nuclear Regulatory Commission determines to be special nuclear material, but does not include source material; or (2) any material artificially enriched by any of the foregoing but does not include source material.
- 10.49 Substantial Safety Hazard - A loss of safety function to the extent that there is a major reduction in the degree of protection provided to public or worker health and safety.
- 10.50 Supplier - An organization furnishing items or services. An all-inclusive term used in place of any of the following: vendor, seller, contractor, subcontractor, fabricator, distributor, consultant, or subtier suppliers.
- 10.51 Transportation Event
 - 1. Any real-time occurrence involving any of the following transportation activities: material classification, packaging marking, labeling, placarding, shipping paper preparation, loading/unloading, separation/segregation, blocking and bracing, routing, accident reporting, and movement of materials.
 - 2. Transportation events involving injury may also require reporting in accordance with Group 3 - Personnel Safety criteria.
- 10.52 Unusual Occurrence - An unusual or unplanned event, having such programmatic significance that it adversely affects or potentially affects the performance, schedule, reliability, security, or safety of a facility.

Title: EVENT CATEGORIZATION/ CLASSIFICATION PROCEDURE <i>Compliance with this procedure is mandatory while performing the activities within its scope. Only a controlled copy may be used in the performance of work.</i>	DOCUMENT NO: EM-0025	
	Date: 11/27/97	Revision No. 3
	Page 43 of 45	

ATTACHMENT A - TYPES OF EXPOSURE

TYPES OF EXPOSURE	ANNUAL LIMIT
Radiological Worker: Whole Body (Internal + External)	5 rem
Radiological Worker: Lens of Eye	15 rem
Radiological Worker: Extremity (Hands and arms below the elbow; feet and legs below the knees.)	50 rem
Radiological Worker: Any organ or tissue (other than lens of eye) and skin.	50 rem
Declared Pregnant Worker: Embryo/Fetus	0.5 rem in 9 months
Minors and Students (under age 18): Whole Body (Internal + External)	0.1 rem
Visitors* and General Public: Whole Body (Internal + External)	0.1 rem

*Applies to visitors who have not completed training in accordance with Articles 632 or 633 or have not met the special considerations of Article 657.

NOTES:

1. Internal dose to the whole body shall be calculated as committed effective dose equivalent. The committed effective dose equivalent is the resulting dose committed to the whole body from internally deposited radionuclides over a 50-year period after intake. See Appendix 2B in the DOE Radiological Control Manual for the weighing factors to be used in converting organ dose equivalent to effective dose equivalent for the whole body dose.
2. Background, therapeutic and diagnostic medical exposures shall not be included in either personnel radiation dose records or assessment of dose against the limits in this Table.
3. See Appendix 2C in the DOE Radiological Control Manual for guidance on non-uniform exposure of the skin.

**Title: EVENT CATEGORIZATION/
CLASSIFICATION PROCEDURE**

DOCUMENT NO: EM-0025

Date: 11/27/97

Revision No. 3

Compliance with this procedure is mandatory while performing the activities within its scope. Only a controlled copy may be used in the performance of work.

Page 44 of 45

ATTACHMENT B - TABLE 1 OF THE EH412 MEMORANDUM "APPLICATION OF DOE 5400.5 REQUIREMENTS FOR RELEASE AND CONTROL OF PROPERTY CONTAINING RESIDUAL RADIOACTIVE MATERIAL"

SURFACE ACTIVITY GUIDELINES
Allowable Total Residual Surface Activity (dpm/100 sq-cm)¹

Radionuclides ²	Average ^{3a}	Maximum ^{3b}	Removable ⁴
Group 1 - Transuramics, I-125, I-129, Ac-227, Ra-226, Ra-228, Th-228, Th-230, Pa-231	100	300	20
Group 2 - Th-natural, Sr-90, I-126, I-131, I-133, Ra-223, Ra-224, U-232, Th-232	1000	3000	200
Group 3 - U-natural, U-235, U-238, and associated decay products, alpha emitters	5000	15000	1000
Group 4 - Beta-gamma emitters (radionuclides with decay modes other than alpha emission or spontaneous fission) except Sr-90 and others noted above ⁷	5000	15000	1000
Tritium (applicable to surface and subsurface) ⁸	N/A	N/A	1000

¹ Excerpt from Responses to Questions and Clarification of Requirements and Processes: DOE 5400.5, Section II.5 and Chapter IV Implementation (Requirements Relating to Residual Radioactive Material), DOE Assistant Secretary for Environment, Safety and Health, Office of Environmental Policy and Assistance (EH-41), Nov. 17, 1995.

NOTES:

¹ As used in this table, dpm (disintegrations per minute) means the rate of emission by radioactive material as determined by counts per minute measured by an appropriate detector for background, efficiency, and geometric factors associated with the instrumentation.

² Where surface contamination by both alpha- and beta-gamma-emitting radionuclides exists, the limits established for alpha- and beta-gamma-emitting radionuclides should apply independently.

³ Measurements of average contamination should not be averaged over an area of more than 1 sq-m. For objects of smaller surface area, the average should be derived for each such object.

⁴ The average and maximum dose rates associated with surface contamination resulting from beta-gamma emitters should not exceed 0.2 mrad/h and 1.0 mrad/h, respectively, at 1 cm.

⁵ The maximum contamination level applies to an area of not more than 100 sq-cm.

⁶ The amount of removable material per 100 sq-cm of surface area should be determined by wiping an area of that size with dry fiber or soft absorbent paper, applying moderate pressure, and measuring the amount of radioactive material on the wiping with an appropriate instrument of known efficiency. When removable contamination on a surface area less than 100 sq-cm is determined, the activity per unit area should be based on the actual area and the entire surface should be wiped. It is not necessary to use wiping techniques to measure removable contamination levels if direct area surveys indicate that the total residual surface contamination levels are within the limits for removable contamination.

⁷ This category of radionuclides includes mixed fission products, including the Sr-90 which is present in them. It does not apply to Sr-90 which has been separated from the other fission products or matrices where the Sr-90 has been enriched.

⁸ Property recently exposed or decontaminated should have measurements (counts) at regular time intervals to ensure that there is not a build-up of contamination over time. Because tritium typically penetrates material it contacts, the surface guidelines in Group 4 are not applicable to tritium. The Department has reviewed the analysis conducted by the DOE Tritium Surface Contamination Limits Committee ("Recommended Tritium Surface Contamination Release Guideline," February 1991), and has assessed potential doses associated with the release of property containing residual tritium. The Department recommends the use of the stated guideline as an interim value for removable tritium. Measurements demonstrating compliance of the removable fraction of tritium on surfaces with this guideline are acceptable to ensure that non-removable fractions and residual tritium in mass will not cause exposures that exceed DOE dose limits and constraints.

**Title: EVENT CATEGORIZATION/
CLASSIFICATION PROCEDURE**

DOCUMENT NO: EM-0025

Date: 11/27/97

Revision No. 3

Compliance with this procedure is mandatory while performing the activities within its scope. Only a controlled copy may be used in the performance of work.

Page 45 of 45

ATTACHMENT C - FEMP FACILITY BOUNDARIES

